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Vol 5 No 2

Acorn launches new generation of BBCs

ACORN is launching a new range of BBC micros this week – five machines in total all based around a 'foundation' model which will replace the BBC B Plus.

The foundation machine is a 128K, 8-bit model based on the CMos low power version of the 6502 chip, the 65C12. "This is the base for a new generation of BBC micros," said Bob Coates, Acorn's product manager for the BBC series. "It looks broadly similar to the existing BBC B Plus, and will be compatible with the majority of current BBC software. You can never get 100% compatibility – but this will be about 80% compatible.

"It has a number of key additional features – for example the cartridge sockets are on top of the machine for sideways Roms, so there is no need to open up the micro. The 65C12, running at 2 Megahertz, is also faster than the existing machines."

The new 128K BBC micro – Acorn would not disclose its name – will be priced at around £500. The package also contains £160 worth of firmware, including View, *Viewsheet*, the advanced disc filing system, and the VT100 terminal emulator.

The second machine in the new range is a 16-bit micro running MS-DOS, with 512k of memory. It will be available as an upgrade to the foundation machine, achieved by unscrewing the circuit board and placing the co-processor board which runs on the Intel 80186 chip. This will also cost about £500.

The third is a 32-bit machine, with 1 Megabyte of Ram, using the 32016 chip. This upgrade is intended primarily for the scientific research market, and will cost around £1,000.

The fourth in the series strips the 'foundation' BBC down to an Econet terminal, and the fifth is a co processor

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THIS WEEK'S NEWS

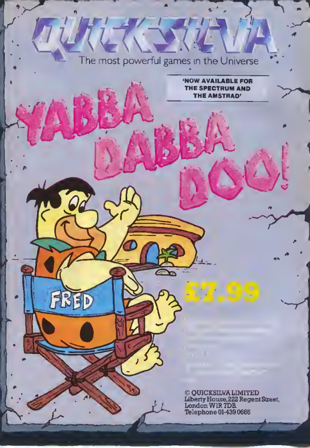
- Soft Aid successor launched
- Commodore closes Corby plant
- US Gold takes on Ultimate

QUICKSILVA is currently working on a game based on the TV film portraying Max Headroom, the allegedly computer-generated TV host.

The game is largely based around a chase sequence in the film, where Max Headroom, in his previous incarnation of Elliott Carter, is being pursued through the TV station Channel 23's building by two would-be assassins.

Max Headroom is due to be launched at the end of February, on the Spectrum, Amstrad and Commodore machines. It will cost £8.99

INSIDE ❯ START COLLECTING THE COUPONS NOW! SEE P12 ❯


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EDITORIAL

Commodore's decision to stop manufacturing in Britain is bad news, both for the company and the Corby community

The Corby plant was Commodore's centre for assembly of home micros for the European market.

Its closure implies a move away from the low end market for Commodore

With the Commodore 64 now looking somewhat long in the tooth and its successor already available, and the struggle of the C16 and Plus/4 to attract attention, the company is pinning all its hopes firmly on Amiga's mast.

The closure almost certainly means the end of the C16 and Plus/4, which were assembled exclusively at Corby

The C16s low specification and the inadequacies of the Plus/4 failed to attract volume sales and have accounted for a good part of Commodore's disappointing financial results during the last nine months

Now the company is to concentrate on the highly automated plants in West Germany and the Far East, and the Amiga technology, which Commodore hopes, will help it regain its position as a world leader

Commodore's Vic 20 was a pioneer of computing power at very low cost for the home user

It will not be looking again for launches at that end of the market for a very long time to come

Editor Christina Erskine **Features editor** Graham Taylor **Software editor** John Cook **Production editor** Lynne Constable **Editorial secretary** Lucinda Lee **Advertisement manager** Jeff Baggett **Advertisement Executive** Diane Holyoak **Advertisement executive** David Dean **Administration** Geraldine Smyth **Managing editor** Peter Worlock **Publishing director** Jenny Ireland **Published by** Sunshine Publications Ltd, 12 13 Little Newport Street, London WC2H 7PP Tel 01-437 4343 Telex 296275 **Typeset by** Publishers Reprographics Services Ltd, 4 Roger Street, London WC1 **Printed by** Greenaway Harrison, Sutton Road, Southend-on-sea, Essex. **Distributed by** S M Distribution, London SW9 Tel 01 274 8611, Telex 561643 (c) Sunshine Publications Ltd 1986

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How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles and any accompanying programs should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work

Computer Trade Association Magazine of the Year

New BBCs from Acorn

◀ continued from page 1

board containing the 65C102 chip Under the name of Turbo, and costing £125, it simply provides a faster version of the base micro

Bob Coates stressed that the new machines will not immediately herald the end of the BBC B Plus in its 64k and 128K versions, the BBC B 32K having already been discontinued. "The B Plus will remain available as long as is economic," he said. "Some people will prefer to have the traditional BBC, though we do expect them to move fairly swiftly over to the new models – they are better value for money We will phase it out when appropriate, but not just yet."

US Gold takes on Ultimate

US GOLD has announced it has taken on all marketing, publishing and manufacture for Ultimate Play the Game's titles, under a contract initially running for one year

This move follows some confusion when reports saying that British Telecom were to fulfil this role were published (see *Popular Computing Weekly*, December 26)

Under the terms of the US Gold/Ultimate agreement, Ultimate will write at least six Spectrum games during 1986 (titles for other machines are not fixed by the contract), which US Gold will publish and market, as well as organising conversions to other machines Conversions to the Commodore 64, Amstrad and possibly the BBC are planned Ultimate apparently wants to concentrate on writing for the Spectrum – including the Spectrum 128 – in the coming year.

"It's a very similar deal to the licensing contracts we have with American companies," said US Gold's general manager Tim Chaney. "We will be licensing six or more games and doing conversions, and we also have taken control of Ultimate's existing inventory The people at Ultimate will now have no contact with marketing, and will continue just as a programming team. We will be paying them on a royalty basis "

The first Ultimate titles to be released by US Gold will be *Dragon Skulle* for the Commodore 64, which is due out this month, followed by *Pentagram* and *Cyberrun* for the Spectrum in February All titles will cost £9 95

Supersoft improves the image

IMAGE-CONSCIOUS owners of Commodore 64s and 128s should be interested in a new peripheral from Supersoft The Print-Technik video digitiser allows your micro to capture a video image from a video camera, recorder or other source and display it on-screen.

Pictures are displayed in four colours – the default is black, white and two grey shades, but any of the 64's 16 colours can be used. Resolution is 256 x 256 pixels, although only 180 x 200 can be shown on screen at once.

Once captured, images can be stored on disc or cassette, or printed out on a range of dot-matrix printers including Epson and Commodore models.

The disc based version costs £148 95, with the cassette version to follow soon Supersoft can be contacted on 01-861 1166

Corby plant shut by Commodore

COMMODORE is to close its factory in Corby with the loss of 250 jobs The decision means that the company no longer has any British manufacturing facility

The decision, according to Commodore International's president, Thomas Rattigan, is because "Commodore is going to increasingly depend on fewer and higher technology plants Corby, being essentially an assembly plant, does not easily fit into this strategy "

Two hundred jobs are being lost at the assembly plant itself, which Commodore opened only 16 months ago with the intention of creating 1,000 jobs A further 50 people will be made redundant at the administrative headquarters in Corby, where there have been some managerial changes

The closure leaves the future of the C16 and Plus/4 machines very unclear They were assembled solely at Corby, and although one Commodore executive said last September that their manufacture would probably cease at the beginning of 1986, Chris Kaday, now sales and marketing director, thinks otherwise

"The C16 and Plus/4 have recently been very successful, although rather late in their lifetime We will be assessing the demand for these products and I do not see why we cannot continue production if the demand is there."

Commodore 64s and 128s, also assembled at Corby, will probably now be entirely made at Commodore's German plant in Braunschweig The closure will not, however, affect production of Commodore's PC 10 and PC 20, nor the Amiga. None of these were intended for assembly in Corby

Commodore's UK's general manager, Nick Bessey, expressed regret at the redundancies "Naturally we greatly regret the impact of this decision on workers who will lose their jobs, but we have been forced to recognise that difficult decisions must be taken in the aggressively competitive marketplace that exists."

However, despite the pull-out in Britain, Chris Kaday asserted that Commodore still expected to show a profit in the current quarter, which will take in the Christmas period.

Commodore may well have to pay back government grants as a result of the closure – Corby is an enterprise zone and financial incentives are often given to companies setting up there

Game designer from Activision

ACTIVISION has announced a game creation package for the Commodore 64

Gamemaker will provide you with a set of tools – including sprite and screen designers, sound generator and music editor – which allow you to create your own arcade games

The program will be available in March, priced at £9.99 on cassette and £14 99 on disc

More games for the Mac

THE SELECTION of games software for the Apple Macintosh is growing, the latest is Sir-Tech's *Wizardry*.

Wizardry is a dungeons and dragons adventure with animated graphics The package is distributed by Softsel at a retail price of £51 55

Soft Aid follow-up launched over dinner

FOLLOWING the success of *Soft Aid*, which has now raised over £350,000, a second charity tape was launched at the Guild of Software Houses/International Society of Software Artists dinner last month. The tape is again to be organised and set up by Rod Cousens, managing director of Electric Dreams Software, who masterminded Soft Aid.

A new compilation tape is to be released, entitled *Off the Hook* Proceeds from its sale will go to the Princes Trust for Drug Abuse Rehabilitation.

Although the tape has not yet been released, already £16,600 has been raised A bottle of champagne was auctioned at the dinner, and 14 software houses placed a corporate bid of £14,000 to buy it. One thousand pounds was raised in a cash collection at the dinner, and profits of £1,500 from the evening make up the total amount raised so far Commodore has also donated an Amiga system to be sold by auction

As yet, the programs to be included on *Off the Hook* have not been finalised "Nine companies have pledged to donate at least one



Firebird, Newsfield, Melbourne House, *Computer Trade Weekly*, Centresoft, Gremlin Graphics, Electric Dreams, Epyx, Ocean, Activision, US Gold and Beyond bosses raised £14,000 for one bottle of champagne.

of their titles," said Rod Cousens "These are Activision, US Gold, Ocean, Gremlin Graphics, Ultimate, Firebird, Melbourne House, Elite and Beyond

"However, I am planning to release *Off the Hook* on the Spectrum, Commodore, Amstrad and BBC machines, so I am hoping that companies which have a strong catalogue on the BBC will also participate "

Off the Hook will cost £6 99 on all formats, and Rod Cousens hopes that all implementations will be released in March Of the £6 99, about £4 00 will go directly to the Princes Trust.

"I would hope that we can raise around £100,000 with *Off the Hook*," Rod continued The money raised through sales of *Off the Hook* will be held by Lightning Distribution in a separate bank account, which has already been set up A committee will make monthly payments to the Princes Trust

Over 100 new products at Amstrad show

THE SECOND Amstrad Computer Show takes place this weekend at the Novotel in Hammersmith, London W6

Organiser Database Publications is expecting over 100 new products to be launched at the show These include Screen Micros' MS-DOS board for the Amstrad CPC 6128, which will give Amstrad owners IBM compatibility

DK'Tronics will be showing its Amstrad peripheral range The Electric Show will show a prototype of a digital tracer and Northern Computers will introduce its hard disc network system.

New software will be launched by Amsoft (a graphic adventure range), Hi-Soft (Catalog, which will keep track of disc files) and Cambrian (a database for the PCW 8256 at £39) among others

The show will open on Saturday and Sunday, January 11 and 12, at 10 am



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Letters

Where are they?

As an Amstrad user, I am interested to see all the Mastertronic tapes in your charts for £1.99 each.

But can you tell me where these can be purchased? None of our local shops stock them and they are not mentioned in the lists of any of your Mail Order services

Can you give me the name of a dealer, or the address of Mastertronic so that I can write to them direct (they never seem to advertise)

Peter Smith
19 Westover Rd
Bournemouth

Mastertronic's address is 8-10 Paul Street, London EC2. Its games can usually be found in places such as newsagents, garages, video shops, supermarkets, and motorway service stations, if you have had no luck in the computer stores.

An evil plot

I've just read *Ziggurat* (Vol 4 No. 51) and I can't let Rod Dawson's famous drivel go unchallenged. It really is time that the myth of jargon being designed to keep out the uninitiated was laid to rest.

A few years ago, there was no such thing as computing. As it developed, new objects, concepts and activities were brought into existence, and new words had to be invented to describe them. You might as well argue that the words tram, internal combustion engine and bus stop were jargon invented to conceal the concept of mass travel from the uninitiated.

It isn't jargon to say Rom, Ram ULA and ASCII – those are their *names!* Rom is computer memory which cannot (normally) be altered, but which retains its data without power. Ram is memory which can be altered, but forgets everything when switched off. A ULA is a computer component which reduces development time and costs by being as general-purpose as possible: its final functions are determined only at the last stage of manufacture. Computers can only work with numbers internally, so we use certain numbers to represent letters and the standard conversion from one t'other is called ASCII. Four pieces of 'jargon', four simple explanations

As for not knowing the values of mega-or giga-, the metric system is the most widespread counting and measuring system we have on this planet: if anyone doesn't know it then something is seriously wrong. Incidentally, our previous system of measurement used such non-jargon as rods, perches, miles, chains, yards and furlongs. I assume Mr Dawson can sort these into size order without looking it up

Mr Dawson's real argument seems to be the depressingly prevalant modern one that, if something involves any effort at all, then don't bother to work to it.

You're right, Mr Dawson, we must "recognise the dynamism of the language, and not expect it to fossilise" Isn't it self-contradictory to tell people not to learn the new words, and "speak English"? Whose English – Dickens', Chaucer's, Shakespeare's or Boethicas's? Exactly when did adding words to the language become an evil plot to baffle the people?

Peter Green
London E4

Roller price

I read with interest a letter written by Mr David Cummings published in *Popular Computing Weekly* dated 19-25 December 1985, concerning Ibico Printer Ink Rollers

I apologize for any confusion concerning the price of the replacement ink roller. I

But officer ... I only drank a thousand pounds worth of champagne!

From Monday, January 13, *Popular Computing Weekly* will not accept any more requests for replacement Micro Magic cards. However, you may still claim prizes for cassette labels, or Amstrad CPC 6128, on your winning cards.

would like to now clearly state that the retail price for this item is £4.95, and is available only from Saga Systems.

As a point of interest, it is not necessary to obtain replacement rollers as they can easily be refilled. To do this remove the ink roller from the printer and submerge in a cup with normal stamp pad ink and a drop of washing up liquid to break the surface tension. Leave overnight, remove from cup and wipe the plastic dry.

D C White
Saga Systems
2 Eve Road
Woking
Surrey

Restrictive

I am amazed by the high rating given to Incentives' *Adventure Creator* by Tony Bridges (19 December). I had the misfortune to by one, and found it was useless for anything except the simplest games. There are just too many restrictions on the type of game you can produce. It is no good having something easy to use if it is not flexible. Plasticine is easy to use, but you wouldn't use it to build the Forth bridge! I think the review was misleading and condescending. We can handle a diet of more then just baby-food, you know!

Fortunately I have access to a copy of *Genesis* from CRL/Camel which is infinitely more useful. Unlike *Adventure Creator* you do not need to do all that pre-planning on paper as it is truly interactive. I'm afraid Incentive's program will not be out of its box very much.

Kevin Marks
5 Ramport Rd
Glasgow

Tony Bridge replies: To write an adventure, I want a simple, easy-to-understand utility, and Incentive's fits the bill perfectly. There is obviously a need to have a closer look at the way in which both programs work and which would be more suitable for the job: I intend to devote a future week's corner to that look.

There's no denying that *Genesis* is very good value, particularly when one compares the prices of the two packages, but 'simple' computer programs are not necessarily 'inflexible'; on the contrary, I believe that *GAC* is *more* flexible than *Genesis* and there are no restrictions that I have found so far.

Spectrum defence

Taking your magazine for the first time this week, I was very pleased to read R J Peters' letter in defence of the Spectrum. I too like the single keyword entry

February of this year was the first time I had ever touched a computer, and since then I have become very attached to my Spectrum Plus. Although tempted by the new Amstrad package, I remain faithful to the Spectrum and look forward to the 128K version.

I wonder if any of your readers have found a way to modify *Tasword* to produce 80 characters per line?

The only problem I have found with the Spectrum is that I cannot LLIST programs on the Brother 1009 because of Spectrum's use of CHR$ (128) to (255) for graphics and commands.

Programs using LPRINT require some modification for the Brother, but this is not too much trouble and the presentation is well worth the effort.

A B Wright
Thatcham
Newbury

Apologies
In our recent survey of bulletin boards (*Popular Computing Weekly*, December 12) we printed an incorrect phone number for the SWAFAX board. The correct number is 0622 850440. We apologise to everyone concerned. We have also been asked to point out that SWAFAX operates two other boards on 0622 858304, and on 0840 820002.

Amstrad Expansion

Hardware Vortex Expansion Board **Micro** Amstrad 464 **Price** 64K – £99.95 (512K – £159) **Supplier** Screen Micro, 6 Main Avenue, Moor Park, Northwood, Middlesex

If you wish your Amstrad 464 could run 6128 software or true CP/M software but the Christmas overdraft means you can't afford a new machine, then perhaps the Ram expansion from Vortex is for you. They are selling at a rate of 2,000 a month in West Germany, so they must be worth considering

For £100 you can have a 64K Ram expansion system which will emulate a 6128, plus the software to re-configure your Amstrad CP/M to give you 62K of program area with an optional 32K printer buffer. This means you can run any standard CP/M 2.2 package on your expanded 464

Any extra memory (a 512K board costs £159) can be configured as a Ram-disc, which on a fully expanded system is 444K formatted.

Also included is a good machine code monitor/assembler/disassembler in Rom, which can be called from Basic even in the middle of running a program and will return to the same point you called it from.

If you program in Basic the system includes a small operating system of RSX's – called by entering *bee-BOS*. Until you do, your machine is unchanged other than losing a few bytes for the RSX to boot the Bank Operating System. When called you have the following options for your extra memory:

- To store screens and recall them at up to three per second
- To store programs and data (up to 288K and 256K respectively with a full 512K expansion)
- To set up a 32K printer spooler which operates whenever you list to the printer

There are also commands which improve graphics control from Basic and others like *bee-GOSUB*, <*bank number*>, <*variable*> and *bee-COMMON*, <*list of variables*> which allow a more structured programming style than otherwise possible in standard Amstrad Basic.

So what are the disadvantages? First, it does not run CP/M+. The manufacturer considers there is plenty of CP/M 2.2 software and the demand for CP/M+ has yet to be shown, although they would do the necessary if demand rises. Secondly, you have to open up your computer to install the board, which would void the 12 month guarantee, but as a large number of 464's are over 12 months old this is not such a drawback

Although DK'Tronics' rival memory expansion is claimed to run CP/M+ you cannot buy CP/M+ for it, and it slots on the back of the computer. Personally, I prefer not to have my computer festooned like a Christmas tree with add-ons. Moreover, the DK'Tronics expansion cannot be used under CP/M 2.2 and does not give the sophistication of the Vortex extra Basic commands. The Vortex board can be easily expanded from 64K through 128K, 256K, 320K up to 512K and you can get the extra memory chips yourself and plug them in (there's even a Vortex program to check if your Ram is OK).

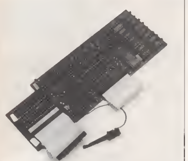
With the Vortex board you do get a full 62K CP/M system with a 32K printer buffer and the Ramdisc option. If you want to use full size CP/M programs, like *Wordstar*, then this will be perfect. The same board will allow you to connect to either 3.5 or 5.25 inch disc drives – even a hard disc – and these will run happily side by side with the Amstrad disc drive. If you have not yet bought a disc drive you can get a twin 5.25 drive (1.5 megabyte formatted) CP/M 2.2 system including this board for £399, with VDOS on Rom which is Amsdos compatible and an Amsdos compatible graphics package

The Vortex expansion comes with instructions on how to install both it and the new CP/M configuration. There is also a brief guide to the software and the machine-code monitor, all contained in a slim booklet

You can tell from the style and humour that it has been translated from German

(All of these are RSXs so must be typed with a bar before them)

Expanded Basic Command Set	Effect
BANK, <integer>	Changes active bank.
BASIC	Returns to Amsdos, removes BOS
CALL, <integer>, <address> [,parameters]	Calls machine code routine in one bank
COMMON [[, <string variable address>], <list of integers>	Declares variables by first letter that will be common to given banks
DEV, <integer>	Determines channel for output of LIST
EMULATE	Configures Ram to emulate a 6128
FAST	Speeds up printing to screen in Mode 2
FRAME	Delays program until next frame flyback
GCHAR,x,y, <integer variable address>	Returns ASCII value of character at x,y.
GOSUB[, <integer>], <line no>	As for Amsdos except may be any bank, and line number may be a variable
GOTO[, <integer>], <line no>	As for GOSUB
GPAPER, <integer>	Changes graphics background colour
GPEN, <integer>	Changes graphics foreground colour
ID	Display status of extra memory allocation
LIST[<list of integers>]	Lists programs in all or selected banks
LOAD, <string variable address>	Loads a program into the bank(s) it was saved from
MASK, <value>	Sets mask for graphics
MON	Calls monitor/assembler/disassembler (available under BOS or just Amsdos)
NEW[<list of integers>]	As for Amsdos except you can select banks
PEEK, <integer>, <addr>, <str var addr>	As for Amsdos but you choose bank to *Peek*
POKE, <integer>, <addr>, <value>	As for Amsdos but you choose bank to *Poke*
RAMCLOSE	Closes the relative data file if open
RAMFIELD, <list of integers>	Sets field lengths list each record in the relative data file
RAMOPEN, <integer>	Opens relative data file and sets record length to be used
RAMREAD, <integer>, <list of var addr>	Reads into selected variables the record given by the integer
RAMWRITE	As for *Ramread* but writes to the record
RECORDS	Returns in system variable REC the number of records available in the data file
SAVE, <str var addr>[, <list of int>	Saves programs in all or selected banks
SCREEN.IN, <integer>	Loads a 16K screen from video Ram
SCREEN OUT, <integer>	Saves screen to video Ram
SCREENS	Returns in SCR the number of screens that can be held in video Ram
SLOW	Reverse the effect of *Fast*
SPOOL ON	Allocates 32K of Ram to a printer spooler
SPOOL OFF	Frees 32K of Ram if spooler allocated
UNMASK	Turns off graphics mask
VIDEO ON	Formats extra memory to hold 16K screens
VIDEO OFF	Reformats memory as when BOS entered



but it is clearly written and I had the board installed within an hour.

You have to remove the Z80 and Amstrad Rom chips from their slots, insert them in the expansion board and then connect it. This calls for some care – put the cat out and shut the door before starting – but no great skill. I was doubtful at first of carrying out this sort of surgery on my own machine but it was really very simple.

Without doubt this memory expansion is good value if you already have a 464 and you find you need full-sized CP/M. Even if you do not own an Amstrad it's worth thinking about. A 464 has a built-in cassette and runs all the 464 software.

With the cheapest Vortex expansion you would be paying the same as for a comparable 6128 system and yet have a full sized CP/M 2.2 and 32K printer spooler.

The product is being distributed by Screen who will be demonstrating this expansion and a similar board for the 6128 at the Amstrad Computer Show at London's Novotel on January 11/12. The German development team will be represented to answer questions about it and the exciting MSDOS board expansion for the Amstrad 464 still under development. Watch this space.

John Mawhood

Name: Bo Jangeborg

Author of Fairlight

"I started learning Basic on a Swedish computer called the ABC – it was a Z80 based thing with 8K, that was in about 1978. That led on to the Spectrum and as I began to realise how slow Spectrum Basic was I started to learn machine code.

Most of my knowledge of machine code came from the Spectrum manual and a book called *Spectrum Machine Code for Absolute Beginners*, neither of which was very good. Later on I got hold of a small reference manual put out by Zilog which had lists of commands with the time they take and how the registers are affected – that was more useful.

Most of my coding experience grew out of necessity. I think what I need to do and then find a way. My program, *The Artist*, began as a drawing program in Basic and gradually was turned into machine code to get the speed.

My advice to any would-be machine code programmers is to begin with one very simple objective, even something like putting a dot on the screen. If you see results quickly it encourages you to try something a little more complicated next time. I wouldn't necessarily get the Zaks reference manual – it's very academic and would probably put most people off.

When coding I mostly use my own utilities like *The Artist* but I also have Hisoft's *Devpac* which I find very good.

The only programmer I can think of that I admire is Mike Singleton. With *Lords of Midnight* he created so many elements that fitted together in a perfect whole and each one was original. I also admire the Ultimate programming team and I was amazed when I first saw *Knight Lore*.

I think my own programming achievement was to create a really fast fill routine for graphics over a year ago. It has been equalled since but at the time it was the fastest. If I had the perfect hardware I'd like to create a 3D high res world with full perspective – it'd be like an intelligent 'world' inside the computer."

Name: Bo Jangeborg

Age: 23

Favourite programs:
Lords of Midnight for the way it mixes excellent graphics with strategic elements (I like wargames), *Fall of Rome* – it was an old Basic game but was fun to play – and *Knight Lore*

Favourite machines.
Hard to say, probably the Atari ST – although the Amiga is better, I'm not sure how well it's going to do. The Amstrad is a very good all round machine but the Spectrum is very much cheaper.

Softography:
The Artist, Fairlight – I'm also working on an upgrade for *The Artist* and may bring out my own graphics language called *Grax* at some point.

Hobbies
I play a lot of wargames and role playing games, at home in Sweden I have hundreds of them. I also run a computer company and shop in Gothenburg with some friends. We sell computers and are doing some business programs for the Atari.

I also read a lot of Science Fiction particularly Steven Donaldson, Asimov and Ursola Le Guin

Special Offer

The Christmas season may be over but here at *Popular Computing Weekly* we're still feeling generous and we've got a bagful of free gifts for our loyal readers.

First of all, we have hundreds of copies of eight Firebird games running on the best-selling machines. Spectrum owners can choose between *Sub-Sunk* and *Don't Panic*; Commodore 64 owners can select *GoGo the Ghost* or *The Helm*, on the Amstrad there's *The Wild Bunch* or *Short's Fuse*; and *Bird Strike* and *The Hacker* running on the BBC B.

If you prefer, you can choose Tony Kendle's *Arcade Champion's Guide* – our arcade ace's handbook to playing some of the best games on a host of machines.

Apart from hints and tips on strategy and features, there are several complete game maps.

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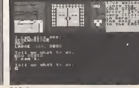
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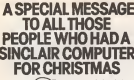
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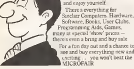


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Bruce's *Armlocks* can really spin you out.

ROCK'N WRESTLE

Take off

Program *QL Flight Simulator* **Micro** QL **Price** £19.95 **Supplier** Microdeal, 41 Truro Road, St Austell, Cornwall.

Up up and away with your QL is the promise from Microdeal. One of the essential programs on a home micro is the flight simulator and there have been the good and the appalling.

Microdeal's falls somewhere in between – the manual spends much of its time apologising for the graphics (it doesn't need to, they're fine) and asking the reader what he/she expects from a mere £200 computer. But the program doesn't warrant such excuses, it can stand on its own three wheels.

The wire graphics I mentioned are good enough to lend quite a realistic air to the view from the cockpit window of your single-engined machine – I particularly liked the floating compass points through which you can fly! On the dashboard your instruments are adequate there are no navigational aids apart from a heading indicator but you also have an altimeter rev counter, gear up/down indicator and artificial horizon, together with rudder/aileron/el-evator indicators.

Your flight takes place over eight "worlds", each of which has its own runway and potential hazards in the shape of mountains, radar dishes, bridges and so on. and the weather in each world *may* be changed to the user's preference. Flying about the air space is as realistic as the taxiing sequence, during which you can refuel at the dump alongside each runway.

Sound is used well, with a lovely start-up burble, but fun isn't really what the program is about. Although there is a bridge and power-line to fly under, this simulator is really for the serious student of flying. While the manual and program are a touch stuffy, there is enough for the merely interested home user – and at a reasonable price – to make this *the* flight simulator for the QL.

Tony Bridge

Marley's ghost

Program *Exodus* **Micro** Commodore 64 **Price** £2.50 **Supplier** Firebird Software, Wellington House, Upper St Martin's Lane, Londno WC2H 9DL

This pocket-money priced game has you trying to destroy numerous strange objects that are attempting to escape from 'The Pit'.

This pit turns out to be an octagonal black shape at the centre of the screen and the objects which fly out include galleons, abominable snowmen, hover mowers, mutant llamas (sounds familiar!) and other horrors. By moving your ship either clockwise or anticlockwise you can cut off their escape but you mustn't touch any object once it has escaped. Even worse, if a llama gets away you lose one of your three lives.

Despite its quirky humour – like extra points for shooting a television tuned to Channel 4 because it's so rare – I found the game quickly lost my attention. The graphics are effective but rather simple and the game itself is actually too easy.

Lionel Carter

Fast lane

Program *Scalextric* **Micro** Commodore 64 **Price** £9.95 **Supplier** Leisure Genius, 3 Montagu Row, London W1U 1AB

I was always really proud of my Scalextric set, I even had a record of racing car noises to go with it. The thing about it wasn't just the racing, but the peripherals that went with it, the grandstands, pit crews, TV cameras and bridges to name but a few.

So how does the computer version compare? The only real comparison to the original is in the track construction. You can design any shape of circuit complete with chicanes, cross-overs and banked curves, subject only to the space available in the screen section. Once designed and saved on to tape you then proceed to the race. From here on in the similarity ends and we are looking at a *Pit Stop II* clone, but with only two cars.

The screen is the usual design split and the position of each car on the track is shown on individual maps.

There are a few disappointments. A banked curve is not graphically shown while racing (you only know it by the lessening of centrifugal force), nor are there any cross-over sections which really makes using them in the design a waste of time.

There are 17 Formula 1 circuits already constructed and are available using the program prompt along with lap numbers from one to 99. During the race the track whizzes along quite smoothly and the cars are graphically pretty, but where are the slots?

Given the choice, I'll buy *Pit Stop II* any day as apart from building the tracks it is really a racing game and not a Scalextric simulation.

Andy Moss

On form

Program *Back to Skool* **Micro** Spectrum **Price** £6.95 **Supplier** Microsphere Computer Services, 72 Roseberry Road, London N10 2LA

School Report – Pupil Eric

Form Master: Eric's behaviour has not improved. At the end of last year we caught him trying to steal his report from the headmaster's safe. Obviously he succeeded because he began this term trying to replace it. We hoped that the redesigned school would confuse him. However, Eric was not averse to creeping out to the neighbouring girls' school.

Biology: There has been the disappearance of a frog from the biology lab, plus the unexpected appearance of several mice elsewhere. When questioned, Eric said that he was trying to redress the balance of nature.

Chemistry: Eric blamed me for the smell outside the headmaster's study when it was caused by his stink bombs. Apparently he used them to get the head to open the window, so he (Eric) could fire his catapult, dislodge a conker and knock out the caretaker!

PE: A fine year for Eric. He learnt to ride a bike and then to leap on the saddle and perform stunts. Unfortunately, this was only in order to put a frog in a cup in the girls' school kitchen.

Geography: If anything matches Eric's ignorance of his own school. I know that the place, with its tribes of swots, bullies and tearaways, is confusing at first but I really suspect him of dodging lessons.

History: I caught Eric looking in a desk. He claimed he was searching for his roots, but had only found a water pistol.

Headmaster's Report: What can I say? He's back and making the lives of my colleagues even worse. However, there's much more for him to do and life would be awfully quiet with out him. Welcome back, you little monster .. here's 5,000 lines.

John Minson

Part three

Program *The Worm in Paradise* **Micro** CBM64/Spectrum 48K/Amstrad/BBC/Atari/MSX **Price** £9.95 **Supplier** Level 9, 229 Hughenden Rd, High Wycombe, Bucks

Level 9's latest release completes the science fiction trilogy which started with *Snowball* *The Worm in Paradise* is also their first adventure to incorporate a new adventure writing system. Taking over a year to perfect, the new system has a 1000 word vocabulary and the most advanced parser ever seen in a cassette based game

Multi-tasking is also a new feature which will enable you to input commands while the graphics are actually drawn, in other words, no more twiddling your thumbs while waiting for the pictures to appear.

The game contains over 200 instantly drawn graphics, unfortunately, or fortunately, depending on taste, because of memory limitations the BBC is text only From a personal point of view, the graphics added nothing to the overall playability of the game

The Worm in Paradise understands a range of commands such as, "Get the Bench and Go East then Drop Bench" Also, "Examine all but the Tree, Gen and Worm than Go Down", far more advanced that the usual verb-noun input

So what about the Adventure? Well, it takes place about a 100 years after the time of *Snowball* and *Eden*. Set in the futuristic world of Enoch, the planet is run by a right-wing political organisation Your aim is to work your way into the 'party' by performing various actions. Hopefully by completing the various tasks in their correct order, you will become a party member, from there it's a uphill struggle all the way to the Seat of Power

Pete Austin's fertile imagination has really been working overtime with some of the problems you are faced with. I never realised finding my way home was so difficult, until I encountered the genuinely frustrating Enoch Transport system.

I don't think a novice adventurer will get very far in this game Even the more experienced player, who has a certain amount of knowledge about Level 9 games will find it quite taxing but definitely rewarding Congratulations, Level 9 on another imaginative hit

Roger Garrett

Word's worth

Program *The Last Word* **Micro** Spectrum **Price** £15.50 **Supplier** Myrmidon Software, PO Box 2, Tadworth, Surrey KT20 7LU.

Suddenly there's a rush of word processors for the Spectrum, and if you have a good quality keyboard plus reliable method of storage it may provide an alternative to the Amstrad 8256, especially if you want it for other applications

The Last Word is very traditional package, with not an icon in sight Instead the information is called by single key strokes, with a variety of shift keys, often after accessing the *Command* mode, and it is displayed in a header In practice this shouldn't interrupt your typing too much once you've learnt your way around the program because the most needed functions, such as cursor control, are most easily available

Screen options for *Last Word* are very good, allowing for up to 80 columns and justifiable line lengths to a total of 132 characters, any words exceeding the line length appear on a line continuation below. This feature is also useful if you don't have an RGB interface, because at 80 columns the characters are very small and unfortunately, though you can change border and header colour, the only options for text are black on white and vice versa

Myrmidon has not skimped on features such as word count, take, etc and there's a novel alarm that screeches out every 30 minutes (though it can be reset) to remind you to save your file Efforts have also been made to include mail merge though this means accessing Basic and setting up strings before returning to the program – not the most elegant solution.

The 30 pages of instructions are written (seven files) with the package, but are not immediately clear, and even with hands on experience will take some getting used to Familiarity will not breed contempt but at the start you'll find yourself stuck every so often.

Details of printer control codes are quite good but *Last Word's* main failing comes to being designed for use with Microdrive

If you were starting from scratch I don't think I'd recommend this – it's certainly not the Last Word in processors However if you're already committed to the Spectrum and want a traditional package, which can handle files from other systems, albeit with a little work, this is worth a look.

John Minson

Logic rules!

Software *LPA Micro-Prolog* **Micro** Commodore 64, (also BBC, Apple II, and others) **Price** £79.93 disc only **Supplier** Logic Programming Associates Ltd, Studio 4, The Royal Victoria Patriotic Building, London SW18 3SX.

Prolog (PROgramming in LOGic) is getting itself into the news at the moment because it is one of those languages designed to make computers work in a way which is more like a brain than a calculator

Traditional computer languages, such as Basic or Fortran, are fine for solving technical problems but become very difficult to work with in many everyday situations

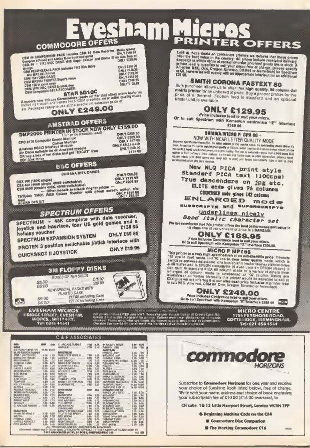
Prolog is aimed at providing a computer language which more closely reflects the way that our brains handle logical problems When presented with an everyday problem our brain seems to rely on our past experience of similar problems to give a first attempt at solving the new problem.

Past experiences can be expressed as a series of rules, red-hot coals give you pains in the fingers when touched, £10 notes are quite rare, and so on.

Micro-Prolog is, as the name so aptly implies, a version of Prolog designed for use on microcomputers Micro-Prolog is a non-compiling version of the language, like Basic, and comes with a number of extensions to make the language easier for beginners to understand. Be warned though, Prolog is not the sort of thing which can be learned overnight. Logic Programming Associates has taken the unusual step of not only providing a full 190-page reference manual but also giving you a 100-page book as well, as a general introduction to Prolog

Micro-prolog can give you a working insight into one of the most interesting languages around although you must accept that speed and storage capacity are limited.

John R Cochrane


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ERROR TRAP

by Nigel Mossmon

As many Interface One owners will know, it is possible to define new Basic commands for the Spectrum.

The machine code given below defines a new command which will take the form of *Step Line n*. *Step* and *Line* can be found on the D and 3 keys respectively. This new command will carry out the following operation.

When the *Step Line* command is found the program stores the value *n*. In this case *n* should equal a valid Basic line number. If at a latter stage an error occurs or the Break key is pressed the program will not stop, but will jump to the line specified by *n*. Errors generated by Interface One operations cannot be trapped. This is because of the way to which the Interface generates and prints errors.

As it is likely that users may already have machine code operations attached to Basic programs I have designed the Basic Loader to place the Trap Code at a point specified in Ram. As the Spectrum shifts chunks of memory around during its various operations, it is vital that machine code is placed above Ram Top. The loader uses the clear command to set Ram Top one address below that specified. Any existing variables created by the user prior to the loader being run will, therefore, be destroyed.

As with all Extended Basic, the system variable Vector needs to be poked to the starting address of the Extended Basic. The Basic Loader will also take care of this. If you do not have any other machine code to work around, you can set the program to run at 65293. This will have the effect of preserving the UDG area.

The actual machine code comes in two main sections. The first part is the Extended Basic. This will in the first instance check the syntax of the line/command. The routine entitled *Stend* is a break off point hidden in Shadow Rom. If the computer is running a program then the program resumes at this point. If the syntax is being checked then no return is made. The computer will go on to check the next line or statement for syntax. Those who have studied the Spectrum in some detail will know that the bottom of the machine stack holds an address in Rom. This address is in fact the routine for the handling of errors. The action part of the Extended Basic (the part after the *Call Stend*) simply replaces the Rom address with that of the trap routine.

If at a latter stage there is some error or interuption of the Basic, the computer will enter the trap routine. This will cause the computer to resume running the program at the line specified by *Step Line*. In the process the machine stack is rebuilt.

As all Spectrum programmers know, each error report is accompanied by a number, or letter. These range from 0 (the OK report) to R for tape load error. The letter report codes are sorted as values from 10 for A (invalid Argument) to 26 for report code R. However, for some odd reason, error codes stored at 23610 are always one less than their actual value, so report code 0 is in fact stored as 255 and report code R is stored as 25 and 9 is stored as 8 and so on.

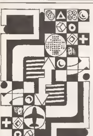
If you create a peeking routine, it is possible to determine the type of error that has occured. This will be useful if you need to determine the difference between a tape load error and the Break key being pressed. This means that you get your Basic programs to take a particular course of action if a certain error takes place (see sample program).

Basic Loader

```
   10 INPUT 'location address ,a
   20 IF a<27000 OR a>65400 THEN  GO TO 10
   30 GO SUB 99  POKE 23735,c. POKE 23736,b  CLEAR a-1: LET a=PEEK 23735+PEEK 237
36*256
   40 FOR d=a TO a+71: READ b: POKE d,b: NEXT d: LET a=a+62: GO SUB 99: LET a=a-6
2: POKE a+32,c: POKE a+33,b: POKE a+44,c: POKE a+45,b
   45 LET a=a+39: GO SUB 99: LET a=a-39  POKE a+63,c  POKE a+64,b: STOP
   99 LET b=INT (a/256): LET c=(a-b*256): RETURN
  100 DATA 215,24,0,254,205,194,240,1,215,32,0,254,202,32,22,2..,32,0,215,..,28,
205,183,5,215,153,30,237,67,176,92,205,75,255,195,193,5,231,0,237,123,61,9.,205,
75,255,237,75,176,92,237,67,66,92,62,0,50,68,92,195,125,27,1,.. 255,42,61,92,113
,35,112,201
```

Sample Program

```
1000>LET X=1000:STEP LINE 9000:PRINT xx
1010 RETURN
1020 BORDER 89
1030 CAT 2
9000 LET error=PEEK 23610: LET x=x+10
9010 IF error=1 THEN  PRINT "I AM SORRY BUT I CAN'T FIND XX"
9020 IF ERROR=6 THEN  PRINT " NO SUBROUTINE"
9030 IF ERROR=19 THEN  PRINT "YOU CAN'T HAVE A BORDER COLOUR 89"
9040 GO TO X
```



AIRFOX

by Alan Brack

In this game for the unexpanded Vic-20, enemy helicopters attack - and you must destroy them before they destroy you.

You have three helicopters at your disposal - the enemy, as many as you can shoot down - but be careful, as your guns will self-destruct if you fire more than two bursts at a time.

Use keys as follows, Z-up, X-down, M fire, or joystick.

The program loads in two parts, the first part holds the introduction page and instructions, the second part, the main code.

Program Notes

Line No	
20-38	Sets UDG's
40-59	Sets up main screen
60-95	Main program loop
300-368	Fire routines
400-515	Blow-up routines
700-750	End routine

```
5 REM***BY ALAN BRACK**
8 PRINT"[CLR]" POKE36879,153
10 PRINT"[RED] ******AIRFOX******' PRINT
12 PRINT"AN ENEMY HELICOPTER ISATTACKING   AND YOU   MUST ZAP IT BEFORE IT ZAPS YOU "
14 PRINT"YOUR GUNS WILL SELF   DESTRUCT IF YOU FIRE  MORE THAN TWO BURSTS  AT A TIME  "
16 PRINT"WATCH YOU DON T CRASH INTO THE SEA  "
18 PRINT YOU HAVE THREE LIVES ' PRINT
20 PRINT"[RVS/ON]KE/S Z=UP,X=DWN,M=FIRE  OR USE JOYSTICK  "
21 PRINT PRINT" [RVS/ON]] SHIFT & RUN/STOP"
22 NEW

20 POKE52,28·POKE56,28
21 FORI=7424TO7431 POKEI 0 NEXTI
22 FORI=7168TO7383·READA POKEI,A·NEXTI
23 POKE36869,255
25 DATA0,0,31,0,0,128,241,127,15,7,1,0,0,7,0,0
26 DATA0,0,255,64,64,248,136,134,131,254,248 144,143,254,0,0
27 DATA0 0,255,2,2,15,17,97 193,127,31,5,137,127 0,0
28 DATA0 0,248 0,0,1,143,254 240,224,128,0,16,224,0,0
29 DATA0 24,102,129,0,24,102,129
30 DATA254,255,255,255,255,255,255,254
31 DATA60 36 16,125,36 10,9,1,18,36,0,129,36,72 144,128
32 DATA0,7,31,63,63,127,127,255,255,255,255,255,255,255,255,255
33 DATA0 224,240,252,252,254 254 255,255,127,127,63 63,31,7,0
34 DATA255,254,254,252,252,240,224,0
38 SC=0,SD=0 SE=0 0=1
40 PRINT"[CLR]"·POKE36879,236 H=7954·U=0 M2=7985 V=36878 S=36877·S1=36875·J=0
41 C=30720 M1=7932 M3=7931 M4=7953·M5=7986·M6=7963 M7=7964·S2=36874·SF=0
45 FORW=8120TO8105·POKEW+C,6 POKEW,0·NEXTW
47 FORW1=8098TO8103·POKEW1,9 POKEW1+C,3 NEXTW1 POKE8010,9 POKE8010+C,3
48 FORW3-8076TO8082 POKEW3,9 POKEW3+C,3 NEXTW3 POKE8032,9 POKE8032+C,3
49 POKE8104+C,3 POKE8083+C,3 POKE8104,233·POKE8083,233 POKE8054,9 POKE8054+C,3
51 IFSD=2THEN57
52 IFSD=1THEN54
53 POKE8058 1·POKE8060 3 POKE8037,0 POKE8038,2
54 POKE8056,1 POKE8057 3 POKE8034,0·POKE8035,2
57 POKE7730 14 POKE7753 14 POKE7705,12 POKE7707,14
58 POKE7727 12 POKE7728,13·POKE7750,13 POKE7749,13·POKE7748,12 POKE7723 13 POKE7751,13
59 POKE7752,13·POKE7771,15 POKE7772,13 POKE7773,13·POKE7774,15 POKE7794,15 POKE7795,16
60 X=INT(RND(1)*8)+1
61 IFX=1ORX=5THENPOKEM2+U,32·POKEM5+U,32·POKEM6+U,32 POKEM7+U,32·U=U+44
62 IFX=2ORX-4THENPOKEM2+U,32·POKEM5+U,32·POKEM6+U,32 POKEM7+U,32·U=U-44
63 IFX=3ORX-6THEN350
65 IFU=>132THENU=132
66 IFU=<-264THENU=-264
67 POKEM2+C+U,0 POKEM5+C+U,0 POKEM6+C+U,0·POKEM7+C+U,0
68 POKEM2+U,5·POKEM5+U,7·POKEM6+U,4·POKEM7+U,6
69 PRINT"[HOME RVS/ON BLK]"SC SC=SC+5·N4-PEEK(197)
70 POKE37137,0·POKE37154,127 J1-PEEK(37137) J2=PEEK(37152) POKEV,15·POKES2,145
71 IF(J1AND32)=0ORH4=36THEN300
72 SF=0
73 IF(J1AND4)=0ORH4=33THENPOKEM+J,32·POKEM1+J,32 POKEM3+J,32·POKEM4+J,32 J=J-22
74 IF(J1AND8)=0ORH4=26THENPOKEM+J,32·POKEM1+J 32 POKEM3+J,32 POKEM4+J,32 J=J+22
80 IFJ=<-242THENJ=-242
82 IFPEEK(M+J)=0THEN500
88 POKEM+C+J,1·POKEM1+C+J,1·POKEM3+C+J,1·POKEM4+C+J,1·POKES1,0
90 POKEM+J,3·POKEM1+J,2·POKEM4+J,1·POKEM3+J,0·POKES1,165
91 IFSC=>3000THENO=9
92 IFSC=>4000THENO=5
93 IFSC=>6000THENO=3
95 GOTO60
300 POKES1,230·POKES,220 FORA=M+J+1TOM+J+8
301 IFPEEK(A)=5THEN400
303 POKEA+C,2 POKEA,240 NEXTA
305 FORA1=M+J+1TOM++J+9 POKEA1,32 NEXTA1·POKES,0 POKEM6+U,4·POKEM6+C+U,0·SF=SF+1
310 IFSF=3THEN500
315 GOTO73·END
350 POKES,210 FORA2=M2+U-1TOM2+U-9STEP-1
351 IFPEEK(A2)=3ORPEEK(A2)=2THEN500
352 POKEA2+C,7·POKEA2,240 NEXTA2
355 FORA3=M2+U-1TOM2+U-9STEP-1·POKEA3,32·NEXTA3·POKES,0·GOTO65
400 POKES1,0 POKES2,0 POKE36879,46 POKEM6+U,10 POKEM7+U,11 SC=SC+1000 SE=SE+1
401 POKES,163 FORL=15TO0STEP-2 POKEV,L
402 FORK=1TO100
403 NEXTK·NEXTL
404 POKES,0 POKES1,0:GOTO40·END
500 POKEM3+J,10·POKEM1+J,11
501 POKES1,0·POKES2,0·POKE36879,46 POKES,163·FORL=15TO0STEP-1
505 POKEV,L·FORK=1TO80 NEXTK NEXTL POKES,0
508 SD=SD+1
510 IFSD=>3THEN700
515 GOTO40
700 PRINT"[CLR]"·POKE36879,23·POKE36869,240
702 PRINT·PRINT·PRINT PRINT'[BLK] YOU DESTROYED  "SE
705 PRINT·PRINT·PRINT PRINT PRINT"[BLK] SCORE=[RED]"SC
707 PRINT PRINT·PRINT PRINT [GRN] ANOTHER GO?   Y N"
709 POKE198,0
710 GETA$ IFA$="Y"THENRUN
720 IFA$="N"THENSYS64802
750 GOTO710

NOTE
[CLR]   PRESS SHIFT & CLR HOME
[RED]   PRESS CTRL & RED

[RVS/ON]  PRESS CTRL & RVS ON
[HOME]   PRESS CLR HOME
[BLK].  PRESS CTRL & BLK
[]   THESE ARE FOR INFORMATION ONLY AND SHOULD NOT BE TYPED
```


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ROCK'N WRESTLE



CLOCK

by Paul Leathley

When the program is run you will see a large clock, a mouse, a piece of cheese, a window for questions and answers and a fruit machine-type object with a lever this the right/wrong machine.

Next, you see in the window the question *"What is the Time?"* You will have noticed that the clock has acquired a pair of hands and using these as a guide you must answer the question Numbers should be entered as figures rather than words, *Quarter, Half, Past* and *To* must be typed fully; *O'Clock* must be typed fully with an apostrophe (Shift 7) after the *'O'* and there must be a space between each word or number After an answer is entered, the lever on the right/wrong machine is pulled.

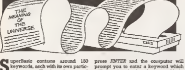
If the answer is right the face at the end of the lever smiles and mouse moves one pace towards the cheese, otherwise the exact opposite happens. When the cheese is reached, a score and assessment is given.

Program notes

80-130	Define characters
170-200	Draw clock as 2 concentric circles
220-230	Print numbers
250-280	Print mouse and cheese.
290	Define Windows.
310-320	Draw right/wrong machine.
340-390	Select random time, draw hands
410-450	Work out correct string for answer.
470-490	Asks time
520-540	Activate machine.
560-620	Checks whether answer is correct.
640-660	Tune.
680-740	Prints score and assessment.
750-780	Error detected.

```
10 REM
20 REM
30 REM
40 REM
50 ON ERROR GOTO 750
60 CLS:LOCATE 1,12:PRINT "IF YOU'VE JUST LOADED,REMEMBER TO PRESS ",,,"STOP":FOR Q=1 TO 1000:NEXT Q
70 REM DEFINE CHARACTERS 203-206
80 SYMBOL AFTER 200
90 SYMBOL 203,126,255,153,255,255,129,255,126
100 SYMBOL 204,51,51,204,204,51,51,204,204
110 SYMBOL 205,120,64,240,216,252,192,120,192
120 SYMBOL 206,0,126,94,118,110,122,94,126
130 SYMBOL 207,96,145,128,95,63,63,63,96
140 MODE 1:CLS:PRINT "QUARTER___HALF___PAST___O'CLOCK___TO"
150 BORDER 0:PAPER 0:PEN 1:INK 0,11:INK 2,26
160 REM DRAW 2 CONCENTRIC CIRCLES
170 REM
180 FOR I=420 TO 60 STEP -2
190 PLOT 176,200,1
200 PLOTR 150*COS(I),150*SIN(I):PLOT 176,200:PLOTR 170*COS(I),170*SIN(I):NEXT I
210 REM PRINT NUMBERS ON CLOCK
220 RESTORE 230:FOR I=1 TO 15:READ X,Y,C:LOCATE X,Y:PRINT CHR$(C):NEXT I
230 DATA 16,6,49,10,9,50,20,13,51,19,17,22,16,20,53,12,22,54,7,21,55,4,17,56,3,13,57,4,9,49,5,9,50,7,6,49,8,6,49,11,4,49,12,4,50
240 N=0:DIR=0:REM NO. OF TRIES & DISTANCE FROM CHEESE
250 LOCATE 26,16:PRINT SPACE$(11);CHR$(208)
260 LOCATE 23,16:PRINT SPACE$(13):PEN 2:LOCATE 26+DIR,16:PRINT CHR$(207);CHR$(205):PEN 1
270 LOCATE 12,13:PRINT CHR$(133)
280 REM WINDOWS
290 WINDOW #1,23,39,6,13:PAPER #1,14:PEN #1,3:CLS #1
300 REM DRAW RIGHT/WRONG MACHINE
310 LOCATE 28,22:PRINT CHR$(135);STRING$(7,CHR$(131));CHR$(139):LOCATE 28,23:PRINT CHR$(133);SPACE$(7);CHR$(138):LOCATE 30,24:PRINT CHR$(141);STRING$(7,CHR$(140));CHR$(142)
320 PLOT 578,40,1:DRAW 610,72:LOCATE 39,21:PRINT CHR$(203)
330 REM PICK A RANDOM TIME
340 RANDOMIZE TIME
350 HR=INT(RND*12)+1
360 MN=INT(RND*12)*5
370 H=450-(HR*30)-(MN/2):PLOT 176,200:DRAWR 75*COS(H),75*SIN(H)
380 REM DRAW HANDS
390 M=450-(MN/5)*30):PLOT 176,200:DRAWR 100*COS(M),100*SIN(M)
400 REM COMPUTER WORKS OUT STRING FOR ANSWER
410 IF MN=0 THEN A$=STR$(HR)+" O'CLOCK":GOTO 470
420 IF MN>30 THEN Y$=" TO":MN=60-MN:HR=HR+1 ELSE Y$=" PAST"
430 IF HR=13 THEN HR=1
440 IF MN=15 THEN Z$=" QUARTER"ELSE IF MN=30 THEN Z$=" HALF"ELSE Z$=STR$(MN)
```

```
450 A$=Z$+B$+STR$(AB):REM A$ CONTAINS THE CORRECT ANSWER
460 REM ASKS THE TIME-TRY$ HOLDS YOUR ANSWER
470 CLS #1:PRINT #1,,"WHAT IS THE TIME?",,
480 INPUT #1,TRY$:TRY$=" "+UPPER$(TRY$):IF LEN(TRY$)<6 THEN 480
490 IF INSTR(TRY$,"O'CLOCK")+INSTR(TRY$,"TO")+INSTR(TRY$,"PAST")+INSTR(TRY$,"QUARTER")+INSTR(TRY$,"HALF")THEN 510
500 PRINT #1,,"TRY AGAIN":GOTO 480
510 REM PULL DOWN LEVER TO ACTIVATE RIGHT/WRONG MACINE
520 PLOT 570,40,0:DRAW 610,72,0:LOCATE 39,21:PRINT " ":PLOT 570,40,1:DRAW 650,0:LOCATE 39,25:PRINT CHR$(203)
530 REM MACHINE IN ACTION
540 RESTORE 650:FOR I=1 TO 20:GOSUB 640:LOCATE 29,23:PRINT STRING$(7,206):CALL &BD19:LOCATE 29,23:PRINT STRING$(7,CHR$(204));NEXT I
550 REM CHECK YOUR ANSWER AGAINST CORRECT ONE-ANS$ HOLDS  RIGHT  OR  WRONG
560 IF TRY$=A$ THEN ANS$="RIGHT ":CH=224:DIS=DIS+1 ELSE ANS$="WRONG ":CH=225:DIS=DIS-1
570 LOCATE 29,23:PRINT ANS$:LOCATE 39,25:PRINT CHR$(CH)
580 IF TRY$<>A$ THEN PRINT #1,,,"THE ANSWER WAS  .",,,,A$
590 FOR DELAY=1 TO 5000:NEXT DELAY
600 REM ERASE HANDS & MACINE LEVER
610 PLOT 176,200,0:DRAW 100*COS(H),100*SIN(H):PLOT 176,200:DRAW 75*COS(H),75*SIN(H):PLOT 570,40,0:DRAW 610,0:LOCATE 39,25:PRINT " 
620 N=N+1:IF DIS=10 THEN 680 ELSE IF DIS=-4 THEN DIS=-3:GOTO 200 ELSE 260
630 REM HICKORY DICKORY DOCK-NO=NOTE,DU=DURATION
640 READ NO,DU:SOUND 1,NO,DU:RETURN
650 DATA 550,20,506,20,478,20,478,30,426,50,379,50,338,80,568,30,568,30,478,30,426,40,379,30,338,80,478,30,356,30,356,50,379,30,379,
50,426,50,426,30,478,40
660 DATA 478,30,426,30,478,30,536,50,568,50,638,50,716,150
670 REM MOUSE REACHES CHEESE
680 CLS:LOCATE 15,5:PRINT "WELL DONE !":LOCATE 6,10:PRINT "YOU GOT TO THE CHEESE IN";N;"GOES"
690 MES$=5+(N<25)+(N<20)+(N<15)+(N<10):RESTORE 740:FOR I=1 TO MES:READ MES$:NEXT I
700 LOCATE 10,15:PRINT "THAT ";MES$
710 LOCATE 4,20:PRINT "DO YOU WANT TO START AGAIN (Y/N)"
720 K$=UPPER$(INKEY$):IF K$="Y" THEN 100 ELSE IF K$<>"N" THEN 720
730 END
740 DATA IS VERY GOOD,IS GOOD,IS AVERAGE,COULD BE A LOT BETTER,MEANS YOU NEED PRACICE !
750 PRINT "Error no ";ERR;"detected in line";ERL
760 PRINT:PRINT "See APPENDIX VIII to see details of it.":END
```



KEYWORDS

by Mike Lloyd

SuperBasic contains around 150 keywords, each with its own particular syntax. This is a phenomenal amount for newcomers to the Sinclair QL to learn and even experienced users can be excused for forgetting the precise parameter requirements for, say, the *BEEP* command. This listing displays on the screen a potted User Guide to some of the QL's more difficult commands and concepts and should be far more convenient than delving into the pages of the manual.

To use the facility, type *'help'* and press *ENTER* and the computer will prompt you to enter a keyword which will then be displayed along with its syntax and other useful information in the listing window. Optional parameters are indicated by asterisks. If the keyword is not recognised, an error message is displayed in the command window, and a list of the keywords recognised by the routine can be obtained by entering *'all'*.

As well as giving information about SuperBasic commands the routine can also display keyboard values. Enter either *'KEYROW'* or *'ASCII'* and the appropriate values of any keys subsequently pressed will be displayed. These subroutines can be left by pressing the *ESC* key.

Listing 1 to 4 should be renumbered (after they have been entered) as follows: *RENUM 1 TO 500,24900,1*. This allows the routines to be merged with programs being developed so that the help facility is always available. The *DATA* statements should not be altered as their line numbers are crucial for the correct information to be displayed.

```
100 DEFine PROCedure help
105 LOCal k$,n,loop,a$,max,kwrd$
110 RESTORE 25000:READ kwrd$
115 INPUT#0,'Enter keyword ';k$
120 n = 4 INSTR kwrd$
125 SELect ON n
130 = 0
135 PRINT#0,k$' is not recognised'
140 = 1 TO 72
145 CLS#2:PRINT#2;kwrd$(n TO n-1+LEN(k$)):RESTORE 25000+n:READ max
150 FOR x = 1 TO max:READ a$:PRINT#2,a$
155 = 68:ascii
160 = 69:keytest
165 = 71:list all
170 END SELect
175 END DEFine help

200 DEFine PROCedure ascii
210 CLS#2:PRINT#2;'CHAR  CODE \\ Press ESC to quit'
220 REPeat loop
230 k = CODE (INKEY$(-1))
240 AT#2,1,3:PRINT#2,CHR$(k);'    ';k:CLS#2,4
250 IF k = 27:PAUSE 50:RETurn
260 END REPeat loop
270 END DEFine ascii

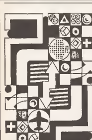
300 DEFine PROCedure keytest
310 CLS#2:PRINT#2,'KEYROW \   ROW   COL \\ Press ESC to quit'
320 REPeat loop
330 FOR x = 0 TO 7
340 k = KEYROW(x)
350 IF k: AT#2,2,3:PRINT#2,x;k:CLS#2,4
360 IF x = 1 AND k = 8:RETurn
370 NEXT x
380 END REPeat loop
390 END DEFine keytest

400 DEFine PROCedure list all
410 RESTORE 25000:ted = 1
420 CLS#2:PRINT#2'HELP available for'
430 FOR x = 1 TO [illegible]:READ a$:PRINT#2;a$(x TO [illegible] to [illegible]) ...
440 END DEFine list all
```

```
25000 DATA BEEPBLOCKBORDERCIRCLECLSCALLBLBYTESPAWPRINTSBYTESSCROLLWIN
DOWOPENSDATEoperatorsasciikeyrowall
25001 DATA 3, Length: -32768 to 32768: 0 = forever , Pitch#1: 0 (high)
 to 255 (low) , * Pitch#2 , * Grad X: 0 to 32768 , * Grad Y , * Wrap:
0 to 15 , * Fuzzy: 0 to 15 , * Random: 0 to 15
25006 DATA 4, * #channel , width (pixels) , height , x co-ord (pixels)
, y co-ord , colour
25010 DATA 3, * #channel , width , * colour
25016 DATA 6, * #channel , x co-ord (graphics) , y co-ord , radius , *
 eccentricity , * angle
25022 DATA 7, * #channel , * screen area (0 to 4): , 0 whole screen
(default) , 1 above cursor line , 2 below cursor line , 3 all cu
rsor line , 4 right end of cursor line
25026 DATA 8, * #channel , width (pixels),height (pixels) , 0 (a)
   0 (10) , 1 (0) ( (20) , 2 (3) , 3 ?
(a)
25030 DATA 2, file name , start address
25034 DATA 8, * #channel , distance (+ right, - left) , * screen area
(0 3 4): , 0 whole screen (default) , 3 all cursor line , 4 righ
t end of cursor line
25037 DATA 8, * #channel , ! intelligent space , , tab to co
lumns per tab) , \ new line , ; no line feed , TO x: tab x
spaces
25044 DATA 3, file name , start address , code length
25050 DATA 8, * #channel , distance (+ down, - up) , * screen area (0,
1,2): , 0 whole screen (default) , 1 above cursor line , 2 below
 cursor line
25056 DATA 5, * #channel , width (pixels) , height , x co-ord , y co-o
rd
25062 DATA 8, #channel , device (scr con_ ser net mdv flp) , SCR (
ac)X(dn)A(x)X(y) , CON_(ac)X(dn)A(x)X(y)_buffer , MDV(drive)_(file
name) See User Guide for NET SER FLP
25065 DATA , OPEN_IN :open mdv file - read only , OPEN_NEW :open new
 mdv file
25066 DATA 2, yyyy,mm,dd,hh,mm,ss , eg 1985,12,25,12 30,30
25071 DATA 30, = equals (case specific) , == equals (case indep
endent) , + - add subtract , * / multiply divide
25072 DATA < less than , > greater than , <= less than or
equal to , >= greater than or equal to , <> not equal to , &
 concatenate strings , MOD integer modulus , DIV integer divide ,
INSTR compare string content , ^ raise to power
25073 DATA , Logical Bitwise , AND && , OR || , XOR
 ^^ , NOT ~~
25096 DATA 4,5,6,a,3,5,a,3,8,a,a,a,8,5,8,5,6,3
```

FIND FACILITY

by David Viner



A useful feature found on some computers is a *Find* facility. It searches through a Basic program for a specific string of characters, usually a variable, and then displays all the line numbers where the string was found.

This program is a no frills implementation of such a facility for the BBC micro. To make the routine quicker, part of it has been written in assembler.

The routine prints out the line number onto either the screen or, if *VDU2* is put before the *Rem* in Line 32020, to both the screen and printer.

The easiest way to use the routine is to **Spool* it to disc and then to merge it with the **Exec* command onto the program you want to scan.

Type *Goto32000* and enter your search string (eg, enter 'pass' which will then match with and list out Lines 32200, 32220 and 32600). Note that Basic commands or keywords will not be found as these are not held in memory as normal ASCII codes but are converted to one byte tokens (see page 483 of the user manual for the token values).

The listing has *Rems* to explain how the routine works.

It may be wise to change Line 32200 (Listing One) to *For pass= 0 to 3 Step 3* and put *Stop* at Line 32610 in the first *Run* as this will report any errors in the assembler routine due to typing mistakes etc.

Once you are sure the assembly section is running correctly change the two lines back to their original format — otherwise it won't work.

All the routines have high line numbers so that they should not clash with your own programs.

```
32000 DIM FIND 70,string 40         : REM reserve m/c and data area
32010 INPUTsearch$                  : REM get search string
32020 REM add VDU2 to send output to printer
32030 PRINTsearch$
32040 $string=search$               : REM put search string into data area
32050 length=&80
32060 ?length=LEN(search$)          : REM keep a record of the data length
32070 pointerlo=&81
32080 ?pointerlo=PAGE MOD 256       : REM set up start point of search
32090 pointerhi=&82
32100 ?pointerhi=PAGE DIV 256
32110 linehi=&83                    : REM reserve area for copy of line numbers
32120 linelo=&84
32130 bytes=&85                     : REM and number of bytes in line
32140 stringlo=&86                  : REM set up a pointer to the data
32150 ?stringlo=string MOD 256
32160 stringhi=&87
32170 ?stringhi=string DIV 256
32180 count=&88                     : REM reserve two work area bytes
32190 flag=&89
32200 FOR pass=0 TO 2 STEP 2        : REM for two passes through the assembler
32210   P%=FIND                     : REM set the m/c program counter
32220   [OPT pass
32230   LDY #1
32240   CLC
32250   .loop LDA (pointerlo),Y     \ loop to copy line number and
32260   STA pointerhi,Y             \ number of bytes into work area
32270   INY
32280   CPY #4
32290   BNE loop
32300   CLC
32310   TYA                         \ add four to pointer to
32320   ADC pointerlo               \ increment it to the start
32330   STA pointerlo               \ of the actual BASIC
32340   BCC reset
32350   INC pointerhi
32360   .reset LDY #0
32370   STY count                   \ reset count of bytes to zero
32380   .zero LDY #0
32390   .again LDA (stringlo),Y     \ get a byte from data string
32400   CMP #&D                     \ check if end of data reached
32410   BEQ found                   \ and branch if so
32420   CMP (pointerlo),Y           \ else compare it with BASIC line
32430   BNE next                    \ branch if no match
32440   INY
32450   BNE again                   \ else check next byte
32460   .next INC count
32470   LDA count                   \ increment count and
32480   CMP bytes                   \ check if at end of line
32490   BEQ notfound                \ branch if end encountered
32500   INC pointerlo               \ else increment BASIC line pointer
32510   BNE zero
32520   INC pointerhi
32530   BNE zero                    \ and do check again
32540   .notfound LDX #0            \ set flag for no match found
32550   BEQ exit                    \ always branch
32560   .found LDX #255             \ set flag for match found
32570   .exit STX flag              \ store match value
32580   RTS                         \ exit back to BASIC
32590   ]
32600   NEXT pass
32610
32620 REPEAT                        : REM loop until end of program found
32630   pointer=?pointerlo + 256 * ?pointerhi
32640   CALL FIND
32650   IF ?flag>0 THEN PRINT ?linelo + 256 * ?linehi,;
32660   REM above line prints line number if match was found
32670   nextline=pointer + ?bytes   : REM set up for next BASIC line
32680   ?pointerlo=nextline MOD 256
32690   ?pointerhi=nextline DIV 256
32700   UNTIL nextline>LOMEM-3
32710 PRINT
32720 PRINT
32730 VDU3                          : REM turn off printer
```

Screen Dump on Spectrum by M C Ogier

This is a program for a ZX Spectrum, using the RS232C connection of Interface 1 for a screen dump to an Epson LX 80 printer

I have consistently been unable to make the published machine code programs work with my LX 80, so I wrote this short routine in Basic to do the job. It takes 1 minute 45 seconds to dump the whole screen, but it does work!

```
 10 REM   CHARLIE OGIER
BASIC SCREEN DUMP (EPSON LX-80)
 20 LET a=4096: LET c=-2048
 30 LET e=224: LET h=-32
 40 LET i=1792: LET j=-256
 50 OPEN #3,"b"
 60 LPRINT CHR$ 27;CHR$ 51;CHR$
24;
 70 FOR s=20480 TO 20511
 80 LPRINT CHR$ 13;CHR$ 10;
 90 LPRINT CHR$ 27;CHR$ 75;CHR$
192;CHR$ 0;
100 FOR d=s TO s-a STEP c
110 FOR b=d+e TO d STEP h
120 FOR g=b+i TO b STEP j
130 LPRINT CHR$ (PEEK g);
140 NEXT g: NEXT b
145 NEXT d: NEXT s
150 LPRINT CHR$ 27;CHR$ 64
160 CLOSE #3
```

Disc Directory on Amstrad by J Dunnett

This is a short offering for owners of Amstrad 6128s and 664s – note that it will not run on a 464.

On running, it permits the Disc Directory command CAT to be output to a printer, without resorting to machine code.

```
1 MODE 2:WHILE INP(&F500) AND 64:LOCATE 25,13:PRINT CHR$(24);" THE PRI
NTER IS OFF-LINE ";CHR$(24):WEND:WIDTH 80:|DISC:FOR Y=0 TO 4:PRINT#8:N
EXT
2 LOCATE 34,2:PRINT"DISCPRINT":LOCATE 2,5:PRINT"Disc Title/Number/Date
:":PRINT:INPUT" ",DN$:PRINT#8,"DIRECTORY: ";DN$:PRINT#8:CLS:CAT:X=1:Y=
4
3 WHILE A$<>"(":LOCATE X,Y:A$=COPYCHR$(#0):PRINT#8,A$;:IF X=80 THEN X=
1:PRINT#8:Y=Y+1:GOTO 3 ELSE X=X+1
4 WEND:PRINT#8,"res":FOR Y=0 TO 4:PRINT#8:NEXT:PRINT:PRINT:PRINT CHR$(
24);" TAB-NEXT DISC.  SPACE-EXIT  ";CHR$(24)
5 G$=INKEY$:IF G$="" THEN 5 ELSE IF G$=CHR$(9) THEN CLS:GOTO 2 ELSE IF
G$=CHR$(32) THEN MODE 1:END ELSE 5
```

Word Wrap on QL by A Pritchard

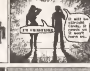
This is a very simple procedure for the QL which ensures that words are not truncated at the end of a window... that is, it provides a word wrap

It does this without needing to specify the window size or character size because it uses the "|" print delimiter

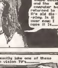
```
0000 REMark FITWORD, A.Pritchard 1985
0010 REMark Procedure to word wrap
0020 REMark any length of text to any
0030 REMark window width in any mode.
0040 REMark Parameters : channel,text
0050 :
0060 DEFine PROCedure fitword(c,a$)
0070 LOCal l,ll,z,b$
0080 ll=LEN(a$)
0090 IF ll=0 THEN RETurn
0100 l=1
0110 REPeat fword
0120    z=" "INSTR a$(l TO ll)
0130    IF z=0 THEN
0140       b$=a$(l TO ll)
0150       z=ll-l
0160    ELSE
0170       b$=a$(l TO l+z-2)
0180    END IF
0190    l=l+z
0200    PRINT#c,'b$'
0210    IF l>=ll THEN
0220       EXIT fword
0230    END IF
0240 END REPeat fword
0250 END DEFine
```

The Rogue Program

THIRD and MOUSE/nmx















A new year

To start the year off as we mean to go on here are a fistful of pokes and tips for top games starting with a collection from regular tipster Paul Miller. *Commando* from Elite is an excellent implementation of the popular arcade game, with some of the smoothest movement and slickest animation seen on the Spectrum. However it's not easy, so you may welcome the routine printed below for infinite lives and grenades.

Paul has also given us a cheat mode for the Spectrum version of *Elite* Like the program we published for the Commodore a few weeks ago this works by doctoring the saved game files so you have to start by loading *Elite* and saving your commander straight away.

Now type in and run the following program

```
10 FOR   =23296 TO 23328 READ Y
POKE X, Y NEXT X
20 DATA 88 88 88 881, 32 0 128,
17, 102 0, 205 86, 5 861 205 181 2
284 58 32 08 42 88 821 88 0 182
17, 102, 0 205 124, 4, 101
```

Now rewind your saved *Elite* commander and enter *Randomise Usr 23296* to load the data in Press play on the tape

You can then enter your pokes as follows

Poke 32791, X – x tonnes of food
Poke 32792, X – x tonnes of textiles
Poke 32793, X – x tonnes of radio-actives
Poke 32794, X – x tonnes of slaves
Poke 32795, X – x tonnes of liquor
Poke 32796, X – x tonnes of luxuries
Poke 32797, X – x tonnes of narcotics
Poke 32796, X – x tonnes of computers
Poke 32799, X – x tonnes of machinery
Poke 32800, X – x tonnes of alloys
Poke 32801, X – x tonnes of firearms
Poke 32802, X – x tonnes of furs
Poke 32803, X – x tonnes of minerals
Poke 32804, X – x kilos of gold
Poke 32805, X – x kilos platinum
Poke 32806, X – x kilos gem-stones
Poke 32807, X – x tonnes of alien items
Poke 32820,255 – fuel scoops
Poke 32821,255 – escape pod
Poke 32822,255 – energy bomb
Poke 32823,255 – energy unit
Poke 32824,255 – docking comp
Poke 32825,255 – galactic hyperdrive
Poke 32816,255 – large cargo bay
Poke 32817,255 – ECM system
Poke 32809, 3· *Poke* 32810, 3
Poke 32611, 3. *Poke* 32812, 3
Give Front, Rear, Left and *Right Military Lasers*

To resave your commander enter *Randomise Usr 23310*

More old friends of the column are that pair known as the Langley Hackers, writing this time with a routine to get infinite lives in Bubble Bus's *Starquake*.

Run this line of program.

```
10 FOR A=23300 TO 23318. READ B.
POKE A, B NEXT A. 58 88 848 881
33 0 84 17 0 182 206 88 5 201
```

Next enter and run this

```
10 CLEAR 24100 RANDOMISE USR
23300
```

Now bypass the first loader on your *Starquake* tape and press play The game will load and then stop with a *nonsense in Basic* message. You can then enter your pokes

Poke 50274, 0. infinite lives
Poke 32427, N Number of joysticks
Poke 50279, 255 full pads after you die (?)

Finally type *Randomise Usr 24100* and the game will start.

Finally Andrew Postlewhite of Rotherham has sent in a badly needed cheat routine for Melbourne House's *Gyroscope* Run the following and play the tape from the beginning:

```
CLEAR 24083
LOAD "code" CODE
POKE 53922,0        (infinite lives)
POKE 54270 201      (no aliens)
POKE 53138 201      (infinite time)
RANDOMISE USR 52880 TO START
```

Andrew also offers these quick tips for *Fairlight* which he has finished: "Use the small potion bottles for strengths or for removing the monks (in the tower with the cross on the lower level floor) by pushing it along the floor until it hits them."

Tony Kendle

```
   1 REM     COMMANDO POKES
   2 REM
   3 REM  By Paul Miller ©1985
   4 REM
  10 CLEAR 40000
  20 LET TOT-0
  30 FOR A=40000 TO 40027
  40 READ B: POKE A,B
  50 LET TOT=TOT+B
  60 NEXT A
  70 IF TOT<>3790 THEN  CLS : PR
INT AT 8,0; FLASH 1;" ERROR IN D
ATA LINES 1000-1040 ": STOP
  80 FOR A-65030 TO 65090
  90 READ B
 100 IF B=999 THEN  GO TO 130
 110 POKE A,B
 120 NEXT A
 130 RANDOMIZE USR 40000.
      REM  RUN CODE
 140 STOP
1000 DATA 221,33,67,254,17,168,1
1010 DATA 62,255,55,205,86,5,48
1020 DATA 241,62,172,50,203,255
1030 DATA 62,84,50,204,255,195
1040 DATA 205,255
1050 REM

            INFINITE LIVES

1060 DATA 175,50,7,108
1070 DATA 50,8,108,50,9,108
1075 DATA 50,6,108,50,5,108
1076 DATA 50,4,108
1080 REM
            INFINITE BOMBS

1090 DATA 175,50,254,236
2000 DATA 195,30,100,999

TO GIVE YOURSELF A BIT MORE OF  A CHALLENGE
, YOU COULD ERASE LINES 1050-1090, AND I
NSERT THIS '


1052 REM
          BOMBS = No, of Bombs

1060 DATA 62,BOMBS,50,238,107

1050 REM
          LIVES = No, of Lives

1060 DATA 62,LIVES,50,131,121
```

Tony Bridge's Adventure Corner



Growth industry

One of the big growth industries for adventurers in 1985 was the adventure club. We needn't go into the reasons for this again, since we've discussed them often enough in the Corner, but I'm glad to see that most of them are doing well.

The two largest, Henry Mueller's Adventure Club Ltd (ACL) and Roger Garrett's Adventureline are broadly similar, but have rather different aims. Both run excellent mail order services, that of the ACL being rather more comprehensive, although both offer discounts and lots of special offers. Both also feature a Helpline (in fact, this is the reason for most adventure clubs starting up), though here the Adventureline offers rather more, with five different numbers, each with a very knowledgeable club member in attendance. ACL runs just one number but the help received from this is equally worthwhile and authoritative.

Both outfits run a magazine for members, and it is here that they differ rather sharply. ACL sends out a small-format book of, typically, 20 pages. The Keeper of the Scroll writes, it would appear, the bulk of the content and there's a wealth of information for the adventurer, from how to solve *Zork* (this one has been running for seven months now!), *Sherlock*, *Mordon's Quest* and others, to how to write your own adventure and how to win lots of cash.

There is quite a lot of help crammed into the magazine, of the numbered code variety as featured in Scott Adams's Hint Books and, once upon a time in (ahem) this very Corner. (As an aside, several adventurers have taken me to task for not supplying as much help nowadays but why should I when clubs exist for this very purpose? That is not to say, of course, that we'll never feature it again.) The reviews in ACL's magazine are short but to the point and there is also a (rather somnambulent) letters page.

Adventureline's monthly (modestly called *The Guiding Light*) on the other hand, is larger though the number of pages is similar. The emphasis here is on in-depth reviews and lively discussion on the current state of adventuring by those who play them. Roger Garrett is the editor, but it is very much of a joint effort, with club members taking a very active role in the magazine's format.

Important part

If there is a successor to the late, lamented *Micro-Adventurer*, this will be it, even though it is at the moment, typewritten and monochrome. Help, though an important part of Adventureline's activities, doesn't play a major role in *The Guiding Light*'s format. The readers write some very thought-provoking letters, though the level of the letters page occasionally sinks to the level of an Elf-bashing free-for-all, one correspondent recently, for example, wanting to know why the page had become the contact page for foreign pen-friends and had appeared to drop the hints and tips.

The obvious conclusion to be drawn from the popularity among adventurers of magazines such as these two would seem to be the answer to the first part of that question, and as for the second, well, a lot of *Popular* readers seem to be happy to correspond with any adventurer, no matter where they might happen to live, and exchange views, adventuring experiences and so on. Roger Garrett, incidentally, asks me to point out that he no longer has any connection with *The Adventurer's Guild*.

Ken Matthew's *Adventurer's Guild*, which in a way spawned many of the clubs now in existence, has been quiet for some time now, which is a shame, get well soon, O Bulbous One.

```
You are on Baker
Street. To the
north there is the
front door. You
can see a hansom
cab. In the hansom
cab there is the
cabbie.

>> LOOK.
>> PAY CABBIE 1/6.
>> SAY "TAKE ME TO ALDERGATE. .
>> LOOK.
>> +
```

***Sherlock* from Melbourne House**

A magazine which is generally computerish and not particularly adventurish, though it does contain reviews of adventures is *Interface*. I mention it here largely because the editor, Lucian Randall, was good enough to say hallo to the Grand Elf at the recent ZX Microfair, but also because it is astounding value at just 20p. The reviews reflect what computer users *really* think of the games, the review of *Fairlight* in the latest issue pointed out that it was "the closest thing yet to Dungeons and Dragons", which is certainly the first time that I've seen that said. Although you can't blame them, software houses tend to be a little suspicious of any club/magazine with a circulation of less than 25,000, which *Interface* is some way from achieving! Apparently, games producers have been known to receive 100 requests a *week* from everyone and the next-door neighbour's goldfish, asking for free "review" copies of the latest software (there are lots of 12-year-old Derek Brewsters and Tony Bridges out there!), so it's a half-dozen cheers to Ocean and others for sending tapes to *Interface*.

A broad base

The reason I like these magazines is that they are run by enthusiasts and much of the discussion and information will never be seen in the larger-circulation publications, and it is for this reason that they should be supported. Adventure clubs got off to a bad start, but those I've mentioned, though not the only ones, are building a broad base of subscribers which should see them through to their first anniversary.

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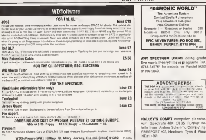
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10	(–)	Pole Position	(Datasoft/US Gold)	£9.95

BBC

1	(1)	Yie Ar Kung Fu	(Imagine)	£9.95
2	(2)	Way of the Exploding Fist	(Melbourne House)	£9.95
3	(6)	Repton 2	(Superior Software)	£9.95
4	(–)	Computer Hits (10)	(Beau Jolly)	£9.95
5	(4)	Revs	(Acornsoft)	£14.95
6	(3)	Strike Force Harrier	(Mirrorsoft)	£9.95
7	(8)	Gyroscope	(Melbourne House)	£9.95
8	(–)	Match Day	(Ocean)	£9.95
9	(10)	Elite	(Acornsoft)	£14.95
10	(–)	Dr Who and the Mines of Terror	(Micropower)	£17.95

Commodore 64

1	(1)	Commando	(Elite)	£9.95
2	(2)	Rambo	(Ocean)	£8.95
3	(3)	Winter Games	(Epyx/US Gold)	£9.95
4	(4)	Little Computer People	(Activision)	£9.99
5	(5)	Mercenary	(Novagen)	£9.95
6	(–)	Goonies	(Datasoft/US Gold)	£9.95
7	(6)	They Sold A Million	(Hit Squad)	£9.95
8	(8)	Last V8	(Mastertronic)	£1.99
9	(10)	Fight Night	(Datasoft/US Gold)	£9.95
10	(–)	Elite	(Firebird)	£14.95

Spectrum

1	(2)	Rambo	(Ocean)	£7.95
2	(1)	Commando	(Elite)	£7.95
3	(3)	Yie Ar Kung Fu	(Imagine)	£7.95
4	(4)	Elite	(Firebird)	£14.95
5	(7)	Saboteur	(Durell)	£9.95
6	(5)	Tomahawk	(Digital Integration)	£9.95
7	(9)	Back To Skool	(Microsphere)	£6.95
8	(–)	Lord of the Rings	(Melbourne House)	£15.95
9	(–)	Winter Games	(US Gold)	£7.95
10	(8)	Spellbound	(Mastertronic)	£2.99

All figures compiled by Gallup/Microscope

Top Twenty

1	(1)	Commando *(Spectrum/C64)*	**Elite**
2	(2)	Rambo *(Spectrum/C64)*	**Ocean**
3	(3)	Yie Ar Kung Fu *(Spectrum/Amstrad/BBC/MSX)*	**Imagine**
4	(14)	Winter Games *(C64)*	**Epyx/US Gold**
5	(4)	They Sold A Million *(Spectrum/C64/Amstrad)*	**Hit Squad**
6	(7)	Way Of The Exploding Fist *(Various)*	**Melbourne House**
7	(5)	Elite *(Spectrum/C64/Atari)*	**Firebird/Acornsoft**
8	(5)	Computer Hits 10 *(Spectrum)*	**Beau Jolly**
9	(10)	Transformers *(C64)*	**Ocean**
10	(9)	Formula One Simulator *(Various)*	**Mastertronic**
11	(15)	Gyroscope *(Spectrum/C64/Amstrad)*	**Melbourne House**
12	(12)	Mercenary *(C64/Atari)*	**Novagen**
13	(21)	Saboteur *(Spectrum)*	**Durell**
14	(20)	Tomahawk *(Spectrum)*	**Digital Integration**
15	(–)	Beach Head *(Spectrum, C64, Amstrad)*	**Access/US Gold**
16	(15)	Little Computer People *(Various)*	**Activision**
17	(24)	Robin of the Wood *(C64/Spectrum/BBC)*	**Odin**
18	(25)	Lords Of The Rings *(Spectrum)*	**Melbourne House**
19	(19)	Back To Skool *(Spectrum)*	**Microsphere**
20	(–)	Spellbound *(Spectrum)*	**Mastertronic**

Figures compiled by Gallup/Microscope

Readers' Chart No 56/7

There were no charts in our last issue Gallup took its Christmas break, and the Readers Chart did likewise So thus, the first Readers' Chart of 1986, is based on two weeks' voting

1	(2)	Elite *(Spectrum/C64/BBC)*	**Firebird/Acornsoft**
2	(1)	Commando *(Spectrum/C64)*	**Elite**
3	(3)	Winter Games *(C64)*	**Epyx/US Gold**
4	(7)	Monty on the Run *(Spectrum/C64)*	**Gremlin Graphics**
5	(4)	Way of the Exploding Fist *(Spectrum/C64/Amstrad)*	**Melbourne House**
6	(–)	Yie Ar Kung Fu *(Spectrum/C64/Amstrad/BBC/MSX)*	**Imagine**
7	(–)	Lord of the Rings *(Spectrum)*	**Melbourne House**
8	(9)	Bored of the Rings *(Spectrum/Amstrad)*	**Delta 4/Silversoft**
9	(5)	Fairlight *(Spectrum)*	**The Edge**
10	(–)	They Sold a Million *(C64)*	**US Gold**

Winning Phrase No 56/7 "No petty mention! I want the dough!" from Philip Arkley of Accrington, Lancs who wins £25 An honourable mention goes to Neil Talbott of Bromsgrove, Worcs, for: "The meaning of life is hype"

Now voting on week 58 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's Readers' Chart, published above

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP

Voting for Week 58 closes at 3pm on Wednesday January 15, 1986 Entries received after that time will not be eligible for inclusion in that week's voting The judges decision is final. Only one entry per individual per week will be allowed.

Name .... **My top 3: Voting Week 58**

Address .... 1. ....

.... 2. ....

.... 3. ....

My phrase is: ....

New Releases

FUTURISTIC

Nomad is another new game from Ocean which should have much appeal for lovers of the classic arcade formats ie, dodging things and killing things a lot In your lone Nomad 471 battle wagon you move across the futuristic capital city, heading towards the secret inner sanctum of the evil Gross

Getting your Nomad across the city involves much swerving and dodging a series of homing missiles, where suicidal robots and heat-seeking weapons lay into you. Combined with magnetic walls to slow you up and a fiendish series of locked gateways, this all makes for much feverish arcade excitement

Nothing too original, of course, but nicely presented with smooth, largish graphics and a sense of pace to keep things interesting

Program *Nomad*
Price *£7 95*
Micro *Spectrum*
Supplier *Ocean Software 6 Central Street Manchester M2 5NS*

INTO BATTLE

The War Game is just that, a war game for the Spectrum Now war games come in two sorts, purist where everything is represented by little squares, and arcade where you get hi-res battle sequences and little animated people

The War Game is certainly in the former class, all squares and simple backgrounds This is not automatically a bad thing, indeed ardent wargamers tend to frown on the glossy stuff, but it does mean that the average arcade gamer is unlikely to be impressed

The battle is set in Europe in the days of horses and muskets Success is all about the tactics adopted in moving your various divisions to positions that use their strengths and avoid their weaknesses, taking note of such natural problems as rivers and forests

The other player or computer controls the enemy, each side is given field reports at various points which indicate morale and the result of battles I must say that I found the game tedious in the extreme, with moves that consist merely of moving a large number of different blocks to different squares on the board I also found it very easy to break into the program, which proves to be

Pick of the week

FIENDISHLY SLICK

Cosmic Wartoad from Ocean software is a) the latest game created by Denton Designs and b) one of the few games I can think of to feature a toad as hero It has by way of extras, some of the nicest and biggest cartoon graphics I've seen in a while and is beautifully presented

In fact, *Cosmic Wartoad* is a series of games played individually as moves across a grid The idea is that as hero you must pass across the King's lair, a matrix of zones wherein some death defying achievement unlocks the route to one of the adjoining zones

You play therefore, a number of games, some of which merely let you pass onward, while others give you useful objects like guns and, on certain squares, a car that will transport you across a number of squares at once Whilst it is the usual three attempts format, using up your three lives doesn't completely reset the game, you retain whatever useful objects you have found

It's played to a time limit represented by a chain saw slowly moving towards a helpless woman tied between two pillars (tasteless) The games, though simple, are very addictive and to begin with, seemingly impossible On the square I managed to complete, one game was a 'shoot - the - dropping - objects - but - don't - let them - fall - on you' affair, another was 'shoot - the - stream - of - bees - buzzing - towards - you', and another, my favourite, involves getting hits on a central slug which is protected by smaller slugs which move towards you

Simple ideas, but presented so well they retain some interest even after the 12th attempt

Extremely entertaining, original in its way, graphically slick and fiendish Need I say more?

Program *Cosmic Wartoad*
Price *£7 95*
Micro *Spectrum*
Supplier *Ocean Software 6 Central Street Manchester M2 5NS*

This Week

Program	Type	Micro	Price	Supplier
Brataccas	Arc	Amiga	£24.95	Psygnosis
Mindshadow	Ad	Amstrad	£5 95	Activision
The Pay off	Ad	Amstrad	£5 95	Bignosa
Who Dares Wins II	Arc	Amstrad	£5 95	Alligata
Music Teacher	Ed	Amstrad	£12 00	Childsplay
The Worm in Paradise	Ad	Atari	£9.95	Level 9
King of the Ring	Arc	Atari	£9 95	Gremlin Graphics
Zone X	Arc	Atari	£12.95	Gremlin Graphics
Brattaccas	Arc	Atari ST	£36 95	Psygnosis
The Pay Off	Ad	BBC	£5 95	Bignose
Tapper	Arc	BBC	£9 95	US Gold
Music Teacher	Ed	BBC	£16.00	Childsplay
Beach-Head	Arc	C16/+4	£7 95	US Gold
Music Teacher	Ed	C16/+4	£7.95	Childsplay
The Pay Off	Ad	Commodore 64	£5 95	Bignose
Z	Arc	Commodore 64	£7 95	Rino
Kaiser	S	Commodore 64	£5 95	Ariolasoft
Flowcharter	Ut	Commodore 64	£12 95	Supersoft
Video s Revenge	S	Electron	£2 99	Budgie
Super Bowl	S	MSX	£2.95	Budgie
Brataccas	Arc	Macintosh	£34 95	Psygnosis
The Knife	Ut	PCW8256	£12 95	Hisoft
Knight Fight	Arc	QL	£14 95	Realtime
Avalon/Dragontorc	Ad	Spectrum	£7.95	Hewson
Mindshadow	Ad	Spectrum	£7.95	Activision
The Pay Off	Ad	Spectrum	£5 95	Bignose
Benny Hill Madcap	Arc	Spectrum	£6 95	DK Tronics
Cosmic Wartoad	Arc	Spectrum	£7.95	Ocean

largely in Basic

However, true wargamers might argue that the fact that it's 'only' a matter of moving squares is the whole point since it's the thought and tactics which count. Probably worth a look for wargamers

Program *Tha War Game*
Price *£7 95*
Micro *Spectrum*
Supplier *Reelax*
24R Cowbridge Road
Pontyclun
Mid Glamorgan

ELECTRONIC

Although Lucasfilm Games are probably best known for the (I thought) overrated *Raid on Fractalus*, to my mind it's *Ballblazer* that is that company's greatest achievement. It may be so astounding piece of programming, but what makes *Ballblazer* is that it is an original yet simple idea executed with imaginative flair

For want of a comparison, it's a little like a stylised, electronic version of American Football played on a giant grid. You control a sort of hovermachine in which you chase after a large ball, capture it and try to blast it between moveable goal posts.

The screen is divided into two sections, your view and your opponent, thus you never actually see your own hovermachine only that of your opponent. You may, by deft handling, steal the ball belonging to your opponent by blasting it way from his grip. That's about all there is to the plot.

The game is beautifully presented and scrolls smoothly as you move across the vast grid-like playing field. Imaginative and incredibly addictive, particularly played against another, human, player

Program *Ballblazer*
Price *£9 95*
Micro *Commodore 64*
Supplier *Activision*
15 Harley House
Marylebone Road
Regents Park
London
NW1 5HE

MEDIEVAL

Knight Flight is probably the best arcade game I've seen on the QL, and whilst it doesn't really show evidence of working on a 68000, at least it compares with Spectrum games

Knight Flight is *Joust* in thin disguise. It depicts a bizarre form of medieval combat where two brave warriors try to unseat each other not from haughty white stallions, but from ostriches, a lesser beast in some respects

The game involves controlling the bird – left right and flap for height – and winning involves bumping the other bird at a greater height than it bumps you. Bumped birds lose their rider and lay an egg, catch the egg in mid-air for extra points

You can play the game either as a two player game or against the computer though fun, I'd have my doubts about two people simultaneously trying to stab away at the QL keyboard.

Unlike most QL games I've seen this at least has quite smooth and non-flickery graphics so it looks professional. It's fast and smooth with sprites wizzing about all over the place. That the game is ancient and was covered on every other machine years ago is perhaps something that's a bit churlish to mention.

If you are actively seeking arcade games for your QL this is a must, however

Program *Knight Flight*
Price *£14 95*
Micro *QL*
Supplier *Realtime Software*
Prospect House
33 Sovereign Street
Leeds
LS1 4BT

ESSENTIAL

Mercenary was a superb 3D line perspective game for the Atari and now it is almost equally superb in a version for the Commodore 64

Mercenary is special in lots of ways, not only does it feature very fast smooth 3D routines, but it uses those routines in a game of complete flexibility. You decide what happens at every point indeed the first thing to discover is exactly what the point of it all is, anyway

The end objective of the game is to escape from an alien planet. A battle rages between two empires, you must ally yourself with one of them, but there are no clues as to which.

You can undertake missions on behalf of either side, but always remember that in the end you're fighting for yourself.

There are both ground based an airborne elements to *Mercenary*, places to explore, things to find and vast spaceships to fly. The game features everything, from strategy to zooming through the sky and blasting things to bits

High in the sky orbits a mothership, that obviously has something of a vital role to play in the game but what exactly ?

The graphics are superb, out eliting *Elite* in places and the mix of ground and space/air setting adds much to the appeal of the game. An essential purchase.

Program *Mercenary*
Price *£9 95*
Micro *Commodore 64*
Supplier *Novagen*
142 Alcester Road
Birmingham
B13 8HS

This Week

Flyer Fox	Arc	Spectrum	£2.95	Bug Byte
Nomad	Arc	Spectrum	£7.95	Ocean
Robots	Arc	Spectrum	£2.95	Bug Byte
Winter Games	Arc	Spectrum	£9.95	US Gold
Zeids	Arc	Spectrum	£7.95	Martech
Wordsearch	S	Spectrum	£67.95	Softfirm

Key Ad – adventure **S** – strategy-simulation
Arc – arcade **Ut** – Utility **Ed** – educaimn

Activision, 15 Harley House, Marylebone Road, London NW1 01-486 7588 **Alligata,** Orange Street Sheffield S1 4DW 0742 755796 **Ariolasoft,** 105/106 Asphalte Close, Palace Street, London SW1E 5U5 **Bigaces,** 320 The Knares Basildon Essex SS16 5SW **Budgie,** 1 Orange Street Sheffield 4DW 0742 755796 **Bug Byte,** Liberty House 222 Regent Street London W1R 7DB 01-439 0666 **Childsplay,** 2 Southview Drive Uckfield Sussex TN22 1TA 0825 4202 **DK Tronics,** Unit 2 Shire Hill Industrial Estate, Saffron Waldon Essex 0799 26350 **Gremlin Graphics,** Alpha House 10 Carver Street Sheffield, S1 4FS 0742 753423 **Hewson,** 7 Grahame Close Blewbury, Oxon OX11 9QE 0235 832939 **Hisoft,** 180 High Street North Dunstable Beds LU6 1AT, 0582 696421 **Level 9,** 229 Hughenden Road, High Wycombe Bucks HP13 5PG 0494 26871 **Martech,** Martech House Bay Terrace Pevensey Bay East Sussex BN24 6EE, 0323 768456 **Ocean,** 6 Central Street Manchester M2 5NS 061 832 6633 **Psygnosis,** 1st Floor Port of Liverpool Building Pier Head Liverpool L3 1BY 051 236 8818 **Rino,** 1 Orange Street, Sheffield 4DW 0742 755796 **Softfirm,** 21 Ashbourne Way Thatcham Berks RG13 4SJ **Supersoft,** Winchester House Canning Road Wealdstone Harrow Middlesex HA3 7SJ 01 861 1166

Premature death

On my desk is a computer magazine which is 18 months old. The articles and advertisements made it belong to a much more primitive age. Machines there heralded as the latest in technological excellence are now regarded as obsolete. The software is positively out of the Stone Age. Looking for stability in this industry is like looking for last year's snow.

All technology products follow a similar pattern. They are introduced, they develop and become accepted, they then become superseded and then they die. Understanding of the market for micro-computers needs to be compared with the life cycle of such products more generally. The intention of those who find utility in the product should be to sustain the introduction and developmental elements for as long a period of time as possible. They must not do anything to curtail or divert it.

In the case of micros however, there is a very real danger that, unless manufacturers 'get their act together' immediately, then the whole product and its market will undergo a premature death. We are witnessing a flight from educational usage and the giving of micros as a seasonal present to the young has passed its peak.

Technological developments seldom keep in step with consumer demand. They are way ahead of it. We already have a surfeit of mind-boggling things which engineering has devised. Most of them mercifully remain in prototype. Coming up with the ideas is not the problem. Shifting the goods in where and when required is. Technology is too abundant and too soon for customer assimilation. By the time any new 'breakthrough' gets to the shops it is probably way out of date. Commodore's Amiga may reach the UK shops later this year, but already Commodore has developed its success.

There is a great deal of self-congratulation among technicians when new heights of speed, design or method are achieved. Whilst these are laudable, these ego-stroking innovations are seldom translated soon enough and customer benefits.

We have not learned historical lessons implicit in other complex products. One such is the motor car. The product had a slow and faltering start, with a proliferation of shapes and motive power until the 4-stroke engine and the saloon design eventually caught on. After the innovatory stage there were many developments in power, performance, comfort and ease of operation. In the maturity phase the product somehow lost its way. Genuine improvements were few but spurious ones abounded.

The motor car is ripe for sweeping change into something more radical – probably initially in its power unit, then later in its conceptual design of an heated moving box.

What parallels do we see in the micro-computer? The start was most auspicious. Development was brisk and proceeded exponentially. We are now in the stage of false product changes, in cosmetic alterations in design and in the attempt to push technical features as if they were customer benefits. Take for example, the superficial changes to many 64K micros – the Amstrad CPC 664 became the CPC 6128, the Commodore 64 has spawned the C128 and a 128K version of the Spectrum is expected this year. None of these are significant technological breakthroughs.

For the industry appears to be at war with itself. We see little evidence of the spirit of compatibility. At the retail level it is almost impossible to get repair or maintenance service for no networks of customer assistance have been systematically developed. How reliable was the last advice you received on the workings and operations of your computer? And the machines are still too expensive for mistakes in purchase to be easily rectified.

The main arena of computer makers and suppliers is still seen as entertainment. This is a notoriously fickle market and subject to fashion and whim. Moreover, the UK's market leader, the Spectrum, contains shortcomings in its graphics and sound capabilities which are more a hindrance in the entertainment software developers. It would be salutary if manufacturers really gave themselves true answers to the twin questions 'What business are we in' and 'What business ought we to be in' – for the answers might be very surprising.

For if we do not take avoiding action now, the whole industry will go the way of the hula-hoop and the skateboard.

Red Dawson

A whole number

Puzzle No 190

At Greyfriars School, Parkin minor was considering his homework on whole number divisors. For example, he knew that the smallest number with exactly ten whole number divisors was 48. The divisors were 1,2,3,4,6,8,12,16,24, and 48. The task that he had was to find the smallest number with one *hundred* divisors, and this was proving a little bit more tricky! He knew that the number itself and one were to be included in the total but the answer escaped him.

45□□□

The answer had been chalked on one of the blackboards, but three of the five digits had been erased. Can you fill in the blanks?

Solution to Puzzle No 186

I bought 19 stamps at 13 pence each, 35 stamps at 17 pence and 46 at 23 pence each.

First, it is necessary to find all permutations of stamps which total 100 stamps in all and whose values sum to an exact number of pounds. This reveals quite a number of possibilities, but the question also stated that the total number of pounds spent was the same as the number of red stamps bought.

```
10 CLS
20 FOR A=1 TO 98
30 FOR B=1 TO 99-A
40 FOR C=100-(A+B)
50 LET SUM=A*13+B*17+C*23
60 IF SUM/100=INT(SUM/100) AND A=SUM/100
   THEN PRINT A B C,SUM
70 NEXT B
80 NEXT A
```

In the program (A) is the number of 13 pence stamps, (B) is the number of 17 pence stamps, and the balance of the hundred stamps is (C), the 23 pence stamps. Line 50 evaluates the total bill, and line 60 tests this value to see if it is an exact number of pounds. However, line 60 also carries out a second check. The value in pounds must also equal the number of one of the values of stamps.

Winner of Puzzle 186

The winner is S Smith of Grimsby, South Humberside, who will be receiving £10

Rules

The closing date of Puzzle 190 is Feb 5

The Hackers

Admit it! You're doing it on purpose! Aren't you?..Eh?..Eh?

The language is called ADA! – After Lady Ada Lovelace! – Lord Byron's daughter!

So STOP calling it LINDA!

MINISTRY OF DEFENSE COMPUTING SECTION

BANG


Sir Fred